

HUMAN GENETICS

Biol 312 – Spring 2018

Instructor: Dr. Diane Caporale
Office: 437 CNR Building
Phone: (715) 346-3922
Website: <http://biology.uwsp.edu/faculty/dcaporal>

Office Hours:
Mon & Wed 10-11 am
E-mail: dcaporal@uwsp.edu

Required for Lecture: 1) Human Genetics: Concepts and Applications (11th ed) by Lewis. Bookstore Rental.

Required for Lab: Biol 312 Lab Manual. For purchase from Bookstore

Meetings	Meeting Times
Lecture	Tues & Thur 2:00-3:15 pm; SCI A208
Lab Sect 1	Tues, 9:00 - 11:50am; SCI B212

Course Objectives:

- 1) study human genes, their functions, mode of inheritance and mutations causing disorders,
- 2) gain knowledge in the clinical manifestations, treatment and gene therapy of human genetic disorders,
- 3) make informed health decisions and bioethical decisions in your future,
- 4) perform human pedigree analyses and molecular genetic testing.

Course Prerequisite: Biol 210 (Genetics). I will expect that you have good background knowledge of the basic principles of classical and molecular genetics. It will be your responsibility to review appropriate materials if necessary. Your textbook has some outstanding chapters (that we will not have time to cover in lecture) to help you to review major genetic concepts.

Lecture Exams	50%	Lab Reports	35%	Participation	15%
1	12.5	Sibling Comparison	5	Oral (PPT) Presentation	10
2	12.5	Human Pedigree	5	Discussions	5
3	12.5	Comt & Actn3 Genotypes	5		
4	12.5	Human Karyotyping	5		
		CSI Investigation	5		
		Bioinformatics	5		
		6 Genotypes of your Choice	5		

Your final letter grade is calculated as follows: The grading scale is firm.

A = 92.5-100	B = 82.5-86.4	C = 72.5-76.4	D = 59.5-66.4
A- = 89.5-92.4	B- = 79.5-82.4	C- = 69.5-72.4	F = < 59.5
B+ = 86.5-89.4	C+ = 76.5-79.4	D+ = 66.5-69.4	

Attendance Policy: Students who must miss an exam due to religious observances or participation in university sanctioned events should notify me within the first 3 weeks of the beginning of class, so makeup arrangements can be made. Other valid excuses for missing an exam or lab are death in the family, serious illness, or accident. In such cases: (1) you must provide evidence of some kind (e.g. note from doctor), **and** (2) you must reschedule **within 24 hrs** after the date of the deadline. Without a legitimate excuse, no make-up will be allowed.

Academic Misconduct: You are responsible for the honest completion and representation of your work and for the respect of others' academic endeavors. Any act of cheating, plagiarism, or academic misconduct is subject to the penalties outlined in UWS Chapter 14. Please refer to this link for more information:

<http://www.uwsp.edu/comm/wdeering/plag.pdf>

Suggested Study Habits:

It is often observed that people learn more when they encounter and interact with subject material in different ways.

The following scale presents representative measures of how we might learn through different forms of interaction.

You learn:

10% of what we **read**
20% of what we **hear**
30% of what we **see**
40% of what we **see & hear**
50% of what we **write**
60% of what is **discussed**
70% of what we **experience**, and
95% of what we **teach**

Before each class:

- a) Read the textbook chapters and summary sections that pertain to the info in the lecture slides (PowerPoint). While reading, take notes on the side of each slide to help clarify the information discussed in class. These notes can be used as lecture slide guide sheets.

Before the exam:

- a) **Rewrite your notes!** For each lecture, continue developing your lecture slide guide sheets and write out the information that was covered for each slide. Try to describe any images/figures on the slide in your own words. Try to do this for each lecture BEFORE the next lecture. Then read it over once to see the whole picture or overall theme of that lecture. When appropriate, make a table of info to help compare concepts.
- b) **Anticipate exam questions.** Come up with 1-2 questions of your own from each slide to quiz yourself later. Definitions, short answers, problems, and comparisons are all good types of questions.
- c) **Study your notes.** At the end of each week you will have made lecture slide guide sheets that include your notes for that material. Before the week's lectures, read over your lecture slide guide sheets and highlight only the information you could not remember.
- d) **Focus your studies.** Before the exam you will have made a set of lecture slide guide sheets with the information you need to reinforce already highlighted. Focus on this highlighted material one or two days before the exam. Reread, highlight info that you are having trouble learning or remembering and say it out loud, to yourself, with another person from class, a friend or study group.
- e) **Practice questions.** At the end of each chapter, try the practice questions (suggested on D2L) before looking at the answers in the back of the book. Write down the ones you do not understand and ask the instructor for guidance with those problems.
- f) **Revisit your study questions.** Try to answer the questions that you generated for each slide. Study with someone in class and try to answer each other's questions.
- g) **Teach your peers.** If you can teach it to another person, then you know it!

The night before the exam:

- a) **Value your sleep.** Being wakeful and well rested can help your performance on the exam. Be sure to get a good night's sleep before the exam. Cramming at the expense of sleep is not the best method.
- b) **Try to relax.** Study hard, but also seek ways to reduce your stress. Take breaks to help refocus your mind.

After the exam:

- a) A good grade can result from **reading** the text and your notes, **listening** to lectures, **seeing** the words and figures, **writing** and **rewriting** notes from class, the **experience** of answering questions from the chapters or provided, and **discussing** topics with another person (saying it out loud).
- b) Your grade should reflect the amount of cumulative effort you put into your studying. Remember, for every hour of lecture, you should do a lot two hours of designated studying time. In other words, for each exam you should be spending about 10-15 hrs studying! It isn't possible to effectively achieve that right before an exam.

If you can teach it to another person, then you know it! **“The best way to learn is to teach!”**

HUMAN GENETICS SCHEDULE

Spring 2018

Week	Date	Topic	Ch: Slides (Lab Pages)
1	Jan 22	Syllabus / Overview of Human Genetics	1
	24	Cells	2
	25	Choose Genetic Disorder for Future PPT Presentation Isolate your DNA	(3-11) (12-13)
2	29	Cells / Development	2 / 3
	Feb 2	Development	3
	1	Preparing for Pedigree; (family phenotypes due Feb 12) Genetic Traits Lab (charts due Feb 5)	(14-15) (17-19)
3	5	Single Gene Inheritance	4
	7	Exceptions to Mendel's Laws	5
	8	(Genetic Traits Chart Due) Directions to Pedigree Analysis; Sibling Comparisons Lab (Report due at end of lab)	(24-25) (16-23)
4	12	Exceptions to Mendel's Laws / Sex-linked Traits	5 / 6
	14	Sex-Linked Traits	6
	15	(Family Phenotypes Due) Human Pedigree Lab	(24-31)
5	19	EXAM I	Ch 1-5
	21	Multifactorial Traits	7
	22	(Pedigree Report due) Warfarin & COMT Lab – PCR 1 Oral Presentation	(32-39)
6	26	Genetics of Behavior	8
	28	Genetics of Behavior / Control of Gene Expression	8 / 11
	Mar 1	Warfarin & COMT & Lab – Gel Electrophoresis 1 Oral Presentation	(40-45)
7	5	Control of Gene Expression	11
	7	Gene Mutation	12
	8	β -Globin Gene Activities; COMT & ACTN3 PCR	(46-47) Insert
8	12	Chromosomes	13
	14	EXAM II	Ch 6-8,11,12
	15	Human Karyotyping Lab; COMT & ACTN3 Gel Electrophoresis; Purify and cycle-sequence	(48-51) Insert

Week	Date	Topic	Ch: Slides (Lab Pages)
9	19	Chromosomes	13
	21	Population Genetics	14
	22	(Human Karyotype Report Due) CSI Lab – PCR; Prepare samples to sequence COMT & ACTN3 Discussion: DNA & Criminal Justice System 1 Oral Presentation	(52-59) (68-69) (70-71)
	26-29	SPRING BREAK	
10	Apr 2	Changing Allele Frequencies	15
	4	Human Ancestry	16
	5	CSI Lab – Gel Electrophoresis; Identify SNPs in DNA sequences of COMT & ACTN3 1 Oral Presentation	(60-67)
11	9	Genetics of Immunity	17
	11	Genetics of Immunity / Genetics of Cancer	17 / 18
	12	(CSI Group Report Due) Bioinformatics Lab – Isolate Cheek DNA & PCR Activities: Genetic Variation in Pops, Genes Trace Human History	(72-81) (96-105)
12	16	Breast Cancer	Extra
	18	EXAM III	Ch 13-17
	19	Bioinformatics Lab – Gel Electrophoresis Discussions: Direct-To-Consumer Genetic Testing 1 Oral Presentation	(82-86)
13	23	Genetic Technologies	19
	25	CRISPR Technology	extra
	26	(Comt & Actn3 Report Due) Bioinformatics Lab – Population Statistics Other Alleles in Your Genome – 4 PCRs Discussions: Genetic Screening and Discrimination	(86-95) (106-113) (118-123)
14	30	Genetic Testing & Treatment	20
	May 2	Reproductive Technologies	21
	3	(Bioinformatics Report Due) Other Alleles – Gel Electrophoresis Personal Genetics & Debate of a Personal Dilemma 1 Oral Presentation	(114-117) Insert
15	7	Reproductive Technologies	21
	9	Genomics	22
	10	(Human Genotypes Report Due) Prevention Genetics Human Genotyping Company, Marshfield All-Day Workshop	(124-126) Insert
Final	Thur 17	EXAM IV (8:00 – 10:00 am); Sci A208	Ch: 18-22